

ATOMIC ENERGY *newsletter*®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

Dear Sir:

August 30, 1960
Vol. 24...No. 2

Sales and earnings of two nuclear instrument manufacturers have been at record levels in recent months. New orders, production and shipments of nuclear instruments by Nuclear-Chicago Corp., Des Plaines, Ill. will be at an all-time high for the company during its fiscal year ending Aug. 31, 1960. A 5% stock dividend will be paid in September by the firm. Research and development, with four major products offered by the company in the past two months and a dozen new products scheduled for the next fiscal year, is the reason for the firm's success according to James M. Phelan, chairman and president of Nuclear-Chicago.....Record high net sales of \$6,093,307 in the first half of 1960 were registered by Victoreen Instrument Co., Cleveland; earnings after taxes were also at a record high of \$260,770. For Victoreen, manufacturer of nuclear measurement and other electronic devices, 1960 sales were almost double the like 1959 period. While profits for 1960 were better than for the comparable 1959 period, they were held down by costs of development and marketing of new products according to David H. Cogan, chairman and president of Victoreen. (Other FINANCIAL NEWS, p. 2 this LETTER.)

One day session, "Handling of Radioactive Material", will be part of the Society of Automotive Engineers' national aeronautic meeting October 10-14, 1960 in Los Angeles. Discussions will center on fabrication and handling of uranium on a production basis; environmental control and regulation and local and state requirements; radioactive materials currently used by industry and future prospects; and licensing, regulation, and control. (Other MEETINGS, p. 4 this LETTER.)

Nuclear reactor at Yankee Atomic Electric Co., Rowe, Mass., achieved criticality last fortnight to mark beginning of test operations some three years after construction began at this site. Following the testing program, buildup to full power is expected before the end of the year. The reactor, designed and developed by Westinghouse Electric Co., is water cooled and moderated. It will furnish steam for 136,000 electrical kw output from the station. Westinghouse and Stone & Webster Engineering Corp. jointly handled engineering design of the plant. (Other MANUFACTURERS' NEWS, p. 3 this LETTER.)

Engineering survey course, "Nuclear Explosives for Excavation and Construction", is a one week review sponsored by College of Engineering and Lawrence Radiation Laboratory of University of California, Berkeley, starting Sept. 6, 1960. The course will attempt to develop an understanding of basic ideas in nuclear energy and will cover large scale excavation with both chemical and nuclear explosives. (Other COURSES, p. 4 this LETTER.)

Nuclear Metals, Inc., Concord, Mass., has bought Crowell Tube Co., Inc., Lexington, Mass., though 100% stock acquisition. Crowell is a large northeastern producer of small diameter tubing for the aircraft, instrument, and other fields. Nuclear Metals, at one time exclusively concerned with nuclear reactor materials, works also with metals for other exacting applications. (Other BUSINESS NEWS, p. 5 this LETTER.)



ATOMIC ENERGY FINANCIAL NEWS...

DEBENTURE OFFERING PROPOSED: Lithium Corp. of America, New York, has filed statement with the Securities and Exchange Commission to offer publicly \$2,300,000 of convertible subordinated debentures due 1970. Proceeds will be used for construction of facilities for production of n-butyllithium and other organolithium compounds; to reactivate the company's North Carolina mining operations; and to liquidate bank debt and replace working capital. (The company has large sums due Quebec Lithium as result of settlement made on refusal of Lithium Corp. to accept new material shipments from the Canadian firm despite firm contract between the two companies. Lithium Corp. had been supplying substantial quantities of lithium compounds to the USAEC. When the Commission cancelled its contract, Lithium Corp. lost large volume of business. It had been obtaining spodumene from Quebec Lithium; with USAEC contract cancelled, it no longer could use the raw material. Lawsuit, initiated by Quebec Lithium, led to out-of-court settlement by the U. S. firm.)

DIVERSIFIED NUCLEAR FIRM HAS BETTER SALES & EARNINGS: Vitro Corp. of America, New York, had sales for the first six months of 1960 of \$30,480,351; this compared with \$27,638,568 for the 1959 like period. Net income for the 1960 period was \$546,398 against \$270,125 earned the same period in 1959. Some \$4 million in bank indebtedness was paid off in the first half of 1960, reducing outstanding loan to \$1,400,000. Vitro Corp., at one time exclusively in the nuclear field, has sold certain divisions until now its Vitro Chemical Co. (processing uranium, beryllium, etc.) Vitro Engineering Co. (nuclear power plants, etc.), and Vitro International (nuclear work abroad) are divisions mainly in nuclear fields. Its primary emphasis, on technologies and "hardware" for defense projects, provides largest portion of its income.

ATOMIC ENERGY PATENT DIGEST...

PATENTS ISSUED August 16, 1960 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:

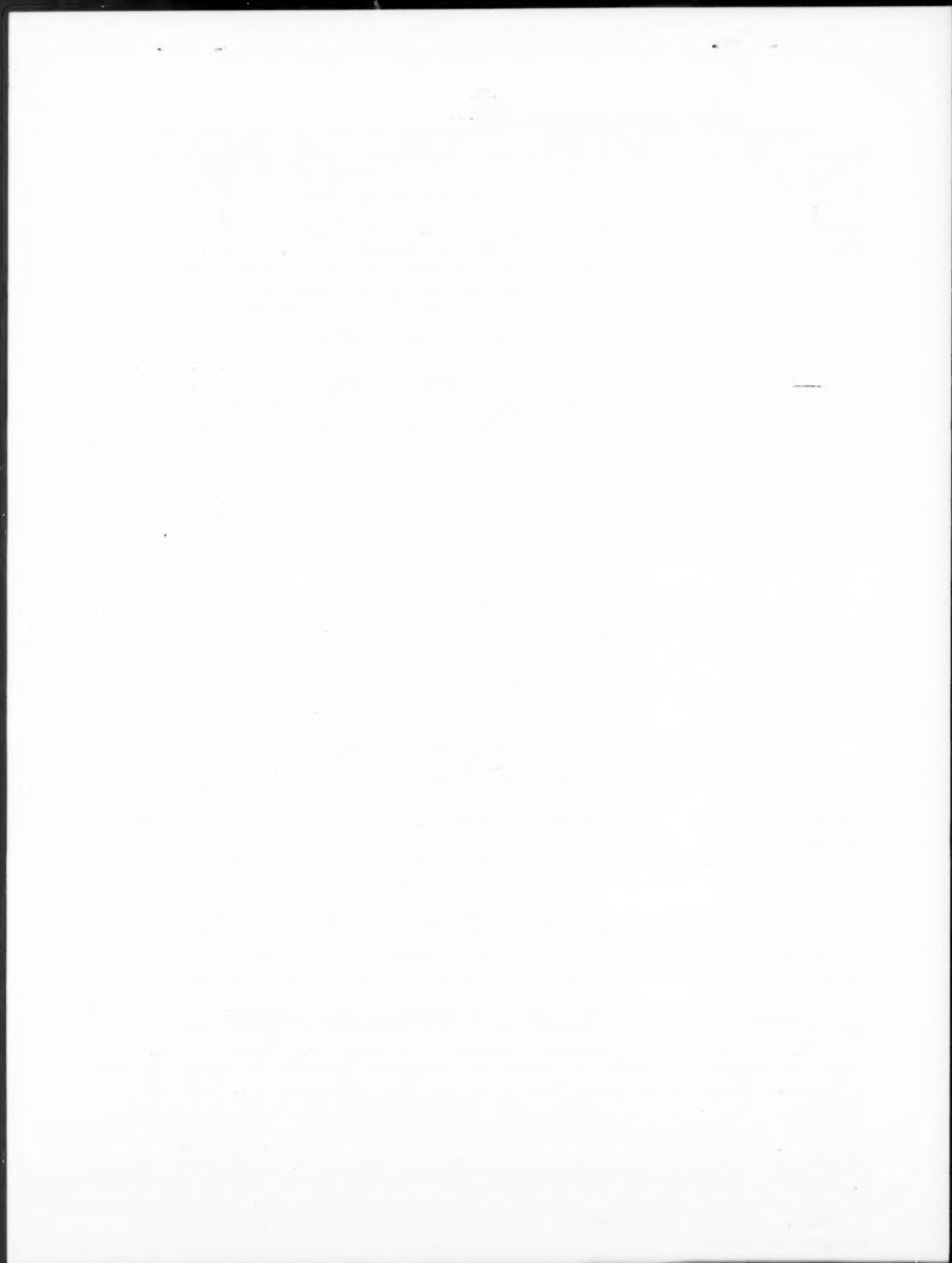
(1) Electrical measuring means for nuclear reactors. John J. Stubbs, Dennis M. Watts, Terence Ingham, inventors. No. 2,949,415 assigned to The English Electric Co., Ltd., London, England. (2) High temperature scintillation detector. Arthur H. Youmans, inventor. No. 2,949,534 assigned to Well Surveys, Inc. (3) Nuclear well logging method and apparatus. Serge A. Scherbatskoy, inventor. No. 2,949,535 assigned to PGAC Development Co., Houston, Tex.

PATENTS ISSUED August 16, 1960 to GOVERNMENTAL ORGANIZATIONS: (1) Housings and mountings for centrifuges. Frank C. Rushing, inventor. No. 2,949,045 assigned to USAEC. (2) Loading and unloading device. Michael Treshow, inventor. No. 2,949,202 assigned to USAEC. (3) Method of protecting tantalum crucibles against reaction with molten uranium. Harold M. Feder, Norman R. Chellew, inventors. No. 2,949,390 assigned to USAEC. (4) Self-regulating boiling-water nuclear reactors. Jackson A. Ransohoff, John D. Plawchan, inventors. No. 2,949,414 assigned to USAEC. (5) Concentric tubular fuel element. Clifford W. Wheelock, inventor. No. 2,949,416 assigned to USAEC.

PATENTS ISSUED August 23, 1960 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:

(1) Method of exploration for locating hydrocarbon and oil. Francis K. Campbell, inventor. No. 2,950,392 assigned to The Moran Corp., Houston, Texas. (2) Gamma compensated neutron detector. Ben. G. Southward, inventor. No. 2,950,393 assigned to The Bendix Corp.

PATENTS ISSUED August 23, 1960 to GOVERNMENTAL ORGANIZATIONS: (1) Method for separation of plutonium from uranium and fission products by solvent extraction. Glenn T. Seaborg, Walter J. Blaedel, Matthew T. Walling, Jr., inventors. No. 2,950,166 assigned to USAEC. (2) Method of inhibiting corrosion in uranyl sulfate solutions. Edward G. Bohlmann, John C. Griess, Jr., inventors. No. 2,950,167 assigned to USAEC. (3) Concentration and decontamination of solutions containing plutonium by bismuth phosphate carrier precipitation methods. Glenn T. Seaborg, Stanley G. Thompson, inventors. No. 2,950,168 assigned to USAEC. (4) Method of suppressing formations in uranium-aluminum alloys. Marion L. Picklesimer, William C. Thurber, inventors. No. 2,950,189 assigned to USAEC. (5) Silicon carbide bodies for use in nuclear reactors. Kenneth C. Nicholson, inventor. No. 2,950,238 assigned to USAEC. (6) Mass spectrometer. Frederick A. White, inventor. No. 2,950,388 assigned to USAEC.



NEW PRODUCTS, PROCESSES, INSTRUMENTS...

NEW PRODUCTS: Log-N period amplifier with seven-decade range and response of one millisecond or less is now offered by this company for nuclear reactor neutron measurement. The new amplifier is said to have an overall accuracy such that the ratio of the true to the observed reading is always greater than 0.7 and less than 1.4. -- General Electric Co., Atomic Power Equipment Department, San Jose, Calif.

Two new radiochemicals have been added by this processor to the list of over 200 biochemicals and radiochemicals it now produces. The compounds, tritiated deoxycytidine and C-14 fructose 1,6 diphosphate, barium are available exclusively from this producer. -- Schwarz Bio Research, Inc., 230 Washington St., Mt. Vernon, N.Y.

PRODUCT NEWS: Cobalt-60 sources for radiography produced by Atomic Energy of Canada, Ltd., are being distributed in the United Kingdom through the industrial division of Watson & Sons (Electro-Medical) Ltd., North Wembley, Middlessex. The sources are made from nickel plated cylindrical pellets of cobalt measuring 1-mm. x 1-mm. which are double sealed in welded stainless steel capsules.

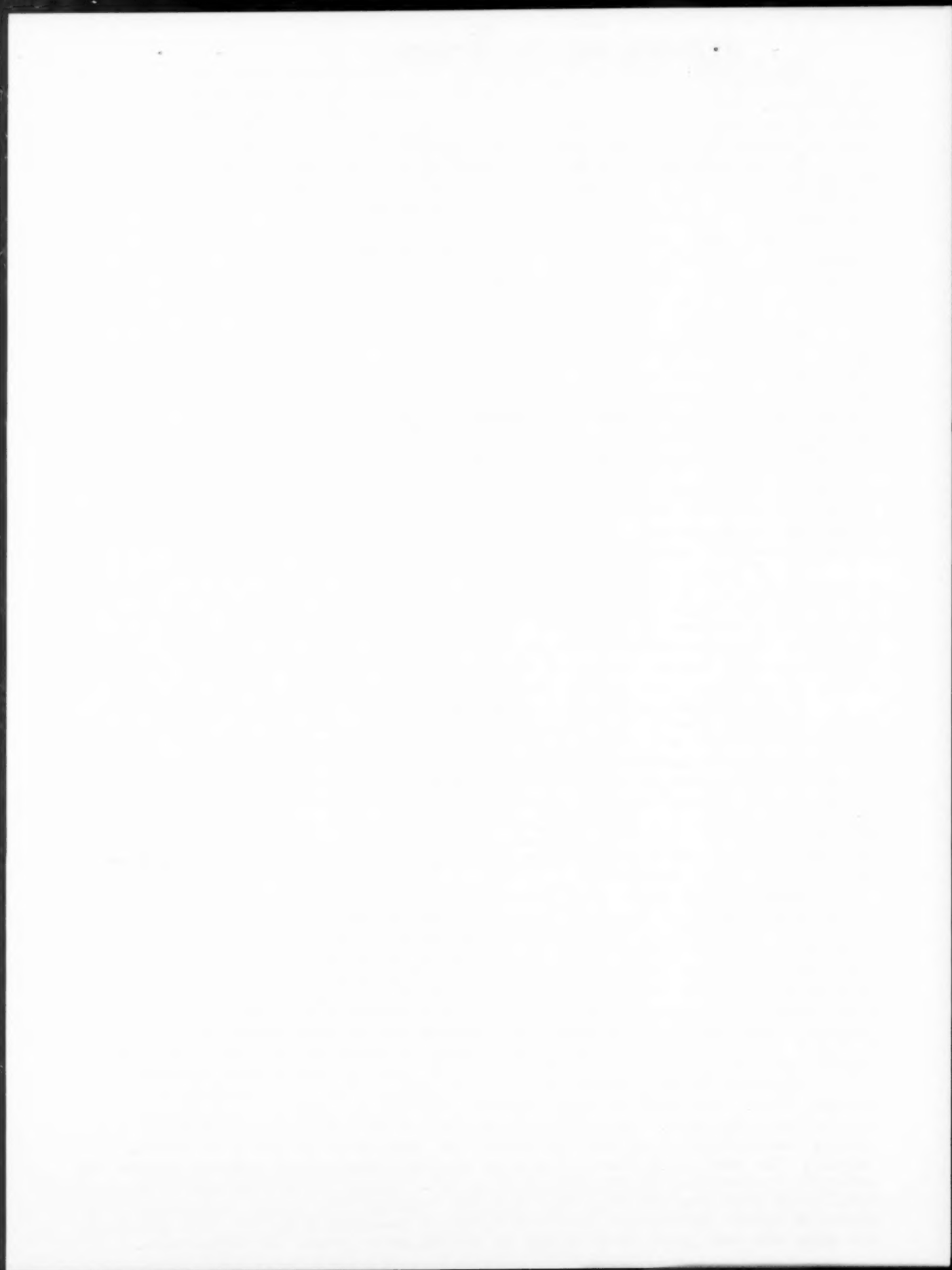
Regulatory and by-product material amendments of the USAEC recently published by the Commission would (1) give license exemption to use of products containing trace amounts of radio-activity, (2) establish design and packing criteria for containers used in sea disposal of low-level radioactive waste material, and (3) require reports from licensees on transfers of special nuclear material. The amendment concerning trace amounts of radioactivity establishes concentrations of radioactivity which industrial firms may safely leave in commercial products, provided they will not be ingested or inhaled. The proposed criteria for waste containers require that these containers remain solid and in one mass until they reach at least 1,000 fathoms, the minimum disposal level. Metals which will sink to this level need not be encased. The reports from licensees on special nuclear material concern individual movements of uranium-233, uranium-235, and plutonium.

Use of nuclear energy to produce hydrazine from ammonia has been explored on a laboratory scale by Aerojet-General Nucleonics, San Ramon, Calif. It is believed the process may enable production of hydrazine for about 50¢ per lb., against the current price of about \$2.12 per lb. Pilot plant operation is now being set up, with in-reactor operation scheduled for the Fall. As projected by Aerojet-General people, the process will involve the use of uranium dioxide to provide a reaction in liquid phase. Temperatures will be high enough to keep the anhydrous ammonia liquefied.

An experimental nuclear core 7-in. high and 7-in. in diameter designed for use in a compact reactor which would produce electrical energy by the thermocouple effect has been put into operation in an experimental program conducted for the USAEC by Atomics International, Canoga Park, Calif. Purpose of the experiment is to obtain physics data for development of a complete reactor system. Eventual applications of the thermoelectricity are in space vehicles. (Fuel and moderator in the experimental device is a homogenous mixture of uranium-235 and zirconium hydride. Heat conduction and reflector units are made of beryllium. The device is divided into two identical units which were brought together by remote control to achieve the sustained chain reaction.)

MANUFACTURERS' NEWS: Some fifteen British manufacturers, including producers of nucleonic and allied instrumentation, will be represented at the International Instruments and Measurements Exhibition, Stockholm, Sweden, Sept. 13-16, 1960. The U. K. Atomic Energy Authority will also exhibit. Among the advanced nucleonics instruments the AEA's Atomic Weapons Research Establishment, Aldermaston, will show is a plutonium-in-air alarm monitor for continuous sampling of air for plutonium alpha activity. It operates by impingement of plutonium dust particles on to a zinc sulfide coated film that is measured continuously with an alpha scintillation counter. Particles about 1 micron in size, such as those of plutonium, are collected more readily than smaller particles such as those of radon or thoron decay products.

Industrial Biology Laboratories, Philadelphia, Pa., and Tracerlab, Inc., Waltham, Mass., are offering their combined services for contract radiochemical testing and assay work. Tracerlab will synthesize the radiochemical materials required; Industrial Biology will administer the compound to be tested to laboratory animals. The part per million and part per billion radiochemical assay of samples and metabolic by-products will be done by Tracerlab. Industrial Biology claims thorough familiarity with Food and Drug Administration requirements, and in conjunction with Tracerlab offers the service to manufacturers of packaging material, food additives, and other who must prove their safety to the FDA under recent new legislation.



NEW BOOKS, OTHER PUBLICATIONS...

Radiation Technology in Food, Agriculture, and Biology. Norman W. Destrosier, Henry M. Rosenstock. Information from physical and biological sciences as applied to uses of nuclear energy in food, agriculture and biology. 407 pages. -- Avi Publishing Co., Box 388, Westport, Conn. (\$12.60)

Advances in Inorganic Chemistry and Radiochemistry. H. J. Emeleus, A. G. Sharpe, editors. Some six sections, written by twelve authors. 392 pages. -- Academic Press, Inc., New York 3. (\$12.00)

The Atomic Nucleus. Robley D. Evans. Useful reference for industrial and research people in nuclear physics, radiation physics and allied fields. (Originally issued in 1955, it has been brought up-to-date through mid-1960.) 950 pages. -- McGraw-Hill Book Co., New York 36. (\$15.50)

The Reactor Supply Industry. Richard A. Tybout, Ohio State University. Result of a survey of reactor component manufacturers reporting employment, investment, and firm size for the reactor supply industry and 12 allied product suppliers. Research Monograph No. 97. -- Bureau of Business Research, Ohio State University. (\$2.00)

State Regulation and the Future of Nuclear Power. Ray E. Untereiner. Report based on studies of two committees of the National Association of Railroad and Utilities Commissioners. No. TID-8208. (50¢).....Physical and Mechanical Properties of Columbium and Columbium-Base Alloys. E. S. Bartlett, J. A. Houck. Evaluation of columbium and seven of its alloys for use in nuclear reactors and space vehicles. No. PB-151,082. 66 pages. (\$1.75).....Radiological Health Data. Monthly report for May, 1960. Vol. 1, No. 2. Prepared by the Public Health Service. No. PB-161,371. (\$3.00 for 6-months subscription.)Status of Chemical Research in Atmosphere Purification and Control on Nuclear-Powered Submarines. R. R. Miller, V. R. Piatt, Naval Research Laboratory. 167 pages. No. PB-161,518. (\$3.00).....Food Preservation by Irradiation. Bibliography of reports. No. OTS-SB-403. (10¢) -- Office of Technical Services, Washington 25, D.C.

Status Report of Heavy Water Moderated Reactors as of 1959. No. TID-8518, Book 4. (\$2.25).....Status Report on Sodium Graphite Reactors as of 1959. No. TID-8518, Book 6. (\$1.00).....Part IV-Plans for Development, as of February 1960 (of the civilian power reactor program). -- Superintendent of Documents, Wash. 25, D.C.

MEETINGS, COURSES, CONFERENCES...

CONFERENCES: Fourth Conference on Analytical Chemistry in Nuclear Reactor Technology and First Conference on Nuclear Reactor Chemistry, under sponsorship of Oak Ridge National Laboratory, Oak Ridge, will be held there Oct. 12-14, 1960. Full details may be obtained from ORNL, Box Y, Oak Ridge, Tenn.

SYMPOSIA: Second and third symposia, of series of six covering Isotopes in Industry, organized and conducted by Western New York Nuclear Research Center, will be held in Syracuse Sept. 14, 1960 and in Rochester Oct. 11, 1960. Further information may be obtained from R. C. McCarthy, Industrial Management Council, 12 Mortimer St., Rochester, N.Y.

Fourth Annual Symposium on Advances in Tracer Methodology is scheduled for Oct. 21, 1960 in Chicago. Sponsoring the Symposium are Baird-Atomic, Inc., and New England Nuclear Corp. Full program is available from R. F. Wood, Baird-Atomic, Inc., Cambridge 38, Mass.

COURSES: All phases of the Public Health Services' radiological training program are now being expanded. Plans are to train some 900 public health people (physicians, engineers, physicists, etc.) in the technicalities of radiation protection for the general public, at the PHS' Sanitary Engineering Center, Cincinnati, during the 12-months period beginning July, 1960. This compares with the 600 trained the previous year. Additional training courses are planned at two regional radio-chemical laboratories recently established by the PHS' division of radiological health at Las Vegas, Nev., and Montgomery, Ala.

The program of financial assistance by the USAEC to educational institutions, for nuclear education, has been extended by the Commission to June 30, 1964. Certain changes have been made, however. In the reactor technology program, no further grants will be made for construction or purchase of teaching reactors. High cost of teaching reactors, compared with other training devices such as subcritical assemblies and reactor simulators, and existence of other federal programs for support of research reactors, which are also useful in laboratory course, influenced commission.

The first part of the paper discusses the general principles of the method of moments, which is a powerful tool for analyzing the behavior of systems. It is particularly useful for systems that are characterized by a large number of degrees of freedom, where the exact solution is often intractable. The method of moments involves calculating the moments of the probability distribution of the system, which can be done using a variety of techniques. The second part of the paper applies the method of moments to a specific problem, namely the calculation of the moments of the probability distribution of the number of particles in a system. This is a classic problem in statistical mechanics, and the method of moments provides a simple and elegant way to solve it. The third part of the paper discusses the limitations of the method of moments, and the need for more sophisticated techniques in certain cases. Finally, the paper concludes with a summary of the results and a discussion of the implications for future research.

CONTRACTS LET, BIDS ASKED...in the nuclear field...

INSTRUMENT CONTRACT LET: Some \$800,000 in contracts have been received by Victoreen Instrument Co., Cleveland, to supply portable radiation survey instruments to the Office of Civil and Defense Mobilization. One of the contracts covers a Geiger counter type of beta-gamma survey meter (model CD V-700), while another is for a meter using an ionization chamber (model CD V-720). Victoreen's Cleveland plant will fill this order. A third contract, for chargers (model CD V-750) for quartz-fibre dosimeters, will be handled by the company's Jordan Electronics division, Alhambra, Calif. (Victoreen is now developing three new types of instruments for OCDM: (1) Device to monitor remote areas from a central point, operating off a 12-v. storage battery. A built-in calibration source would permit checking accuracy. (2) Portable survey meter with ion chamber detector which would discriminate between beta and gamma radiation, operating on two type "D" flashlight batteries. (3) Quartz fibre dosimeter with "built-in" solid state charging device.)

FEED MATERIALS OPERATION CONTRACT EXTENDED: National Lead Co. of Ohio has had an extension granted to its contract under which it operates the USAEC's Feed Material Production Center, Fernald, Ohio. National Lead has operated the Center since its completion in 1954 under extensions to its original contract. The extension now granted by the Commission will run to June 30, 1965. (The Center is an integrated series of plants set up at a cost of about \$110 million, which convert high grade uranium concentrates into highly purified uranium compounds or metal. The site receives these concentrates which are bought by the USAEC from agencies throughout the world.)

URANIUM PURCHASE CONTRACT SIGNED: Uranium concentrates derived from ores developed in the Shirley Basin area on Carbon County, Wyoming will be bought by the USAEC from Petrotomics Co. under contract awarded the firm. Petrotomics is a general partnership of Kerr-McGee Oil Industries, Inc., Oklahoma City; Tidewater Oil Co., Los Angeles; Skelly Oil Co., Tulsa; and Getty Oil Co., Wilmington, Dela. Extending through Dec. 31, 1966 the contract provides for the purchase of uranium oxide derived from controlled eligible ore reserves, and has provisions for ore production in the pre-1962 period which the Commission can direct to existing mills. The contract also permits Petrotomics, at its option, to build a mill for the production of uranium concentrates covered by the agreement in the 1962-66 period. Concentrates sold by the company to USAEC after April 1, 1962 will be at a flat \$8.00 per lb. without amortization.

STUDY TO BE MADE OF FUELING & SERVICING NUCLEAR PROPELLED VESSELS: Ebasco Services, Inc., New York, have received contract from New York State Office of Atomic Development to study existing and potential port facilities in New York State with a view to their handling the fueling and servicing of nuclear propelled vessels and shipments of spent nuclear fuel. Some ten engineering firms had submitted proposals for the job. Under its contract, Ebasco will make estimates for the periods 1960-65, 1966-70, and 1971-75 of the amount of used nuclear fuels and other radioactive materials requiring special handling that will be shipped to and through east coast ports and along the St. Lawrence Seaway, as well as number, type, and tonnage of nuclear propelled vessels that will be handled at these ports.

NUCLEAR FUEL TO BE SUPPLIED: Nuclear core components will be supplied by Olin Mathieson Chemical Corp. for reactors at Fort Greeley, Alaska, and Camp Century, Greenland, under contract awarded the company by the USAEC. Power plants at both sites are being built under the direction of the Army's Corps of Engineers; the camp in Greenland is entirely under ice. Olin Mathieson is producing the components, which will be replacement parts, at its plant in New Haven, Conn.; it is expected that they will last for one year of use in the reactors.

ADDITIONS TO BE MADE TO PLUTONIUM RECYCLE TEST FACILITY: Construction of additions to the plutonium recycle test reactor facilities at Hanford Works, Richland, Wash., will be handled by George A. Grant, Inc., Richland. The Grant firm was low bidder of the five companies submitting proposals.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

August 30, 1960